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EXAMINER	
TRAN, CON P	

ART UNIT	PAPER NUMBER
2644	12

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/298,008	HEIN ET AL.	
	Examiner	Art Unit	
	Con P. Tran	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-2, 4, 6, 13, 15, and 17** are rejected under 35 U.S.C. 102(b) as being anticipated by Defretin U.S. Patent 4,709,388.

Regarding **claim 1,** Defretin teaches an integrated circuit package (low tension circuit CIBT, see Fig. 1 and respective portions of the specification) comprising:

low tension circuit CIBT having sense inputs for a sensed tip signal and a sensed ring signal (sd via 30, 32, 34, 36) of a subscriber loop, wherein the integrated circuit (by microprocessor) generates a control signal (sc) for a subscriber loop linefeed driver in response to the sensed signals, wherein the linefeed driver (preamplifiers and output stages 18, 20, 22, 24 respectively of high tension circuit CIHT) does not reside within a same integrated circuit (see col. 3, line 14 – col. 4, line 17).

Regarding **claim 2,** Defretin further teaches an integrated circuit package as claimed in claim 1, wherein the sensed tip signal includes first and second sampled tip

voltages VA, Va, wherein a difference between the first and second sampled tip voltages is proportional to the tip current (of 30, 32), wherein the sensed ring signal includes first and second sampled ring voltages VB, Vb, wherein a difference between the first and second sampled ring voltages is proportional to the ring current (of 34,36; col. 3, line 35 – col. 4, line 17).

Regarding **claims 4**, Defretin teaches a subscriber loop linefeed driver (high tension circuit CIHT, see Fig. 1 and respective portions of the specification), comprising:

current measuring circuit 38 providing a sensed tip signal and a sensed ring signal (sd) to an integrated circuit (i.e., low tension circuit CIBT), wherein the sensed tip and ring signals (30, 32, 34, 36) correspond to a tip current and a ring current of the subscriber loop (see col. 3, line 66 – col. 4, line 4); and preamplifiers and output stages (18, 20, 22, 24, respectively) for providing battery feed V_p, V_n to a ring node and a tip node of a subscriber loop (10,12, see col. 3, lines 4-23) in accordance with a control signal (sc, col. 3, lines 32-44) generated by the integrated circuit (i.e., low tension circuit CIBT) in response to the sensed tip and ring signals (see col. 3, line 66 – col. 4, line 11).

Regarding **claim 6**, Defretin teaches a subscriber loop linefeed driver as claimed in claim 4. Further, claim 6 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 2.

Regarding **claim 13**, Defretin teaches a interface circuit (see Fig. 1 and respective portions of the specification) comprises essentially an integrated circuit CIHT operating with relatively high voltages which may go up to 150 V (i.e. linefeed driver) and an integrated circuit CIBT operating solely with low voltages up to 10 V. Measurement wires (30 and 32 for stage 22, 34 and 36 for stage 24) transmit information concerning the current flowing in the output stages 22 and 24 to a current measuring circuit 38 which itself outputs information (signal sd) to the low tension integrated circuit. The low tension circuit is especially a circuit for processing signals and controlling the high tension circuit. The low tension sends signal sc back to the high tension circuit for controlling (col. 3 line 14 – col. 4, line 17).

Regarding **claim 15**, Defretin teaches the apparatus of claim 13. Further, claim 15 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 4.

Regarding **claim 17**, Defretin teaches the apparatus of claim 15. Further, claim 17 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 2.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 3, and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Defretin U.S. Patent 4,709,388 in view of Zhou U.S. Patent 5,926,544.

Regarding **claim 3,** Defretin teaches an integrated circuit package as claimed in claim 1. However, Defretin does not explicitly disclose the integrated circuit is a complementary metal oxide semiconductor (CMOS) integrated circuit. The complementary metal oxide semiconductor (CMOS) is well known in the art of integrated circuit. Defretin shows two integrated circuits CIHT and CIBT.

Zhou teaches an integrated circuit is a complementary metal oxide semiconductor (CMOS) integrated circuit (see Fig. 3; col. 5, lines 7-11) in order to efficiently allocate processing resources and control functions (see col. 3, lines 23-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included within the subscriber telephone interface circuit of Defretin an integrated circuit that is a complementary metal oxide semiconductor (CMOS) integrated circuit, as taught by Zhou, since such combination

would have efficiently allocated processing resources and control functions as suggested by Zhou in column 3, lines 23-25.

Regarding **claim 14,** Defretin teaches the apparatus of claim 13. Further, claim 14 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 13.

5. **Claims 5, 7, 16 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Defretin U.S. Patent 4,709,388 in view of Knollman U.S. Patent 5,854,550.

Regarding **claim 5**, Defretin teaches a subscriber loop linefeed driver as claimed in claim 4.

However, Defretin does not explicitly disclose a subscriber loop linefeed driver wherein the sense circuitry comprises:

a tip resistor series-coupled to the tip node and the power circuitry; a pair of tip sampling resistors one end of each tip sampling resistor connected to opposite ends of the tip resistor, the other end of each tip sampling resistor forming a tip sense node; a ring resistor series-coupled to the ring node and the power circuitry; and a pair of ring sampling resistors one end of each ring sampling resistor connected to opposite ends of the ring resistor, the other end of each ring sampling resistor forming a ring sense node.

Knollman teaches a subscriber loop linefeed driver (see Fig. 1, and respective portions of the specification) wherein the sense circuitry comprises:

a tip resistor (R5) series-coupled to the tip node and the power circuitry (see col. 4, lines 12-21);

a pair of tip sampling resistors (R3, R7) one end of each tip sampling resistor connected to opposite ends of the tip resistor, the other end of each tip sampling resistor forming a tip sense node (see col. 4, lines 12-47);

a ring resistor (R6) series-coupled to the ring node and the power circuitry (see col. 4, lines 12-21);

a pair of ring sampling resistors (R4, R8) one end of each ring sampling resistor connected to opposite ends of the ring resistor, the other end of each ring sampling resistor forming a ring sense node (see col. 4, lines 12-47),

in order to provide both current limiting and voltage limiting for the digital communication lines (see col. 2, lines 4-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included within the subscriber telephone interface circuit of Defretin a subscriber loop linefeed driver as taught by Knollman, since such combination would have provided both current limiting and voltage limiting for the digital communication lines as suggested by Knollman in column 2, lines 4-5.

Regarding **claim 7**, Knollman further teaches a subscriber loop linefeed driver (see Fig. 1, and respective portions of the specification) of claim 4, wherein the power

circuitry comprises:

a tip control circuit, wherein the tip control circuit increases a tip node voltage in response to a first tip control signal, wherein the tip control circuit decreases a tip node voltage in response to a second tip control signal (see col. 4, lines 12-21 and see col. 5, lines 14-26); and

a ring control circuit wherein the ring control circuit increases a ring node voltage in response to a first ring control signal, wherein the ring control circuit decreases a ring node voltage in response to a second ring control signal (see col. 4, lines 12-21 and see col. 5, lines 14-26).

Regarding **claim 16,** Defretin teaches a linefeed driver of claim 15. Further, claim 16 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 5.

Regarding **claim 18,** Defretin teaches a linefeed driver of claim 15. Further, claim 18 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 7.

6. **Claims 8, 9, 19, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Defretin U.S. Patent 4,709,388 in view of Knollman U.S. Patent 5,854,550, and further in view of Chen et al. U.S. Patent 5881,129.

Regarding **claim 8**, Defretin in view of Knollman teaches a subscriber loop linefeed driver as claimed in claim 4.

However, Defretin in view of Knollman does not explicitly disclose a subscriber loop linefeed driver wherein the tip control circuit comprises:

a first transistor of a first type having an emitter coupled to receive the first tip control signal; a second transistor of the first type having an emitter coupled to receive the second tip control signal, wherein a base of each of the first and second transistors is coupled to first node; a third transistor of a second type having a collector coupled to a collector of the first transistor and an emitter coupled to a second node; a resistor having a first end coupled to the second node, a second end of the resistor coupled to a base of the third transistor and a collector of the second transistor.

Chen et al. teaches a subscriber loop linefeed driver (see Fig. 1, 4B, and respective portions of the specification) wherein the tip control circuit comprises:

a first transistor (B30F) of a first type having an emitter coupled to receive the first tip control signal (NRGHV1; see col. 3, lines 3-9, see col. 4, lines 12-21 and see col. 19, lines 38-41);

a second transistor (B29F) of the first type having an emitter coupled to receive the second tip control signal (NRGHV2), wherein a base of each of the first and second transistors is coupled to first node (VPR3; see col. 19, lines 38-41);

a third transistor (B4Y2) of a second type having a collector coupled to a collector of the first transistor and an emitter coupled to a second node (connection between R3 and R7; see col. 20, lines 3-10);

a resistor (between R7 and B4Y2) having a first end coupled to the second node (connection between R3 and R7), a second end of the resistor coupled to a base of the third transistor (B4Y2) and a collector of the second transistor (B29F; see col. 20, lines 15-29);

in order to compensate for the transistor's finite forward resistance to prevent longitudinal imbalance (see col. 1, lines 49-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included within the subscriber telephone interface circuit of Defretin and Knollman in combination a subscriber loop linefeed circuit that has the tip control circuit as taught by Chen for purpose of compensation for the transistor's finite forward resistance to prevent longitudinal imbalance, as suggested by Chen et al. in column 1, lines 49-50.

Regarding **claim 9**, Chen et al. teaches a subscriber loop linefeed driver (see Fig. 1, 4B, and respective portions of the specification) of claim 8 wherein the first type is a PNP bipolar junction transistor (B29F), wherein the second type is an NPN bipolar junction transistor (B4Y2; see col. 20, lines 3-9).

Regarding **claim 19,** Defretin in view of Knollman teaches a linefeed driver of claim 18. Further, claim 19 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 8.

Regarding **claim 20,** Defretin in view of Knollman and further in view of Chen teaches a linefeed driver of claim 19. Further, claim 20 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 9.

7. **Claims 10-12, and 21-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Defretin U.S. Patent 4,709,388 in view of Bellenger et al. U.S. Patent 6,63016.

Regarding **claim 10**, Defretin teaches a subscriber loop linefeed driver as claimed in claim 4.

However, Defretin reference does not explicitly disclose a subscriber loop linefeed driver further comprising:

voiceband circuitry for bi-directional communication of voiceband data between the ring and tip nodes and a voiceband data interface, wherein the voiceband circuitry provides the analog voiceband data interface with d.c. isolation from the ring and tip nodes.

Bellenger et al. teaches a subscriber loop linefeed driver (see Fig. 1A, 1B, 2A, 2B, 3, and respective portions of the specification) further comprising:

voiceband circuitry for bi-directional communication of voiceband data between the ring and tip nodes and a voiceband data interface (see col. 12, lines 21-30), wherein the voiceband circuitry provides the analog voiceband data interface with d.c. isolation from the ring and tip nodes (see col. 22, lines 48-54) in order to retrieve

transmission parameters associated with the data terminal and the interface (see col. 4, lines 52-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included within the subscriber telephone interface circuit of Defretin a subscriber loop linefeed driver as taught by Bellenger et al. since such combination would have allowed retrieving transmission parameters associated with the data terminal and the interface as suggested by Bellenger et al. in column 4, lines 52-53.

Regarding **claim 11,** Bellenger et al. further teaches an apparatus of claim 10, wherein the voiceband circuitry (see Fig. 2A, 2B, 4, and respective portions of the specification) further comprising:

a first voiceband data output node (see col. 17, lines 26-35);

a load coupled to the first voiceband data output node (see col. 17, lines 26-35);

a first voiceband data input node, wherein the load and the first voiceband data input node are capacitively coupled to a selected one of the tip and ring nodes (see col. 16, lines 7-13 and col. 7, line 59 – col. 8, line 5).

Regarding **claim 12,** Bellenger et al. further teaches the apparatus of claim 4 (see Fig. 1A, 1B, 2A, 2B, 3, and respective portions of the specification) further comprising voiceband circuitry for bi-directional communication of voiceband data

between the ring and tip nodes and a voiceband data interface, wherein the voiceband circuitry further comprises (see col. 12, lines 21-30 and col. 22, lines 48–54):

a first voiceband data input node capacitively coupled to a selected one of the ring and tip nodes for receiving voiceband data from the subscriber loop, wherein voiceband data transmitted to the subscriber loop is superimposed on the linefeed control signals (see col. 16, lines 7-13 and col. 7, line 59 – col. 8, line 5).

Regarding **claim 21,** Defretin teaches a linefeed driver of claim 15. Further, claim 21 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 10.

Regarding **claim 22,** Defretin teaches a linefeed driver of claim 21. Further, claim 22 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 11.

Regarding **claim 23,** Defretin teaches a linefeed driver of claim 15. Further, claim 23 is interpreted and thus rejected for the reasons set forth above in the rejection of claim 12.

Response to Arguments

8. With respect to objection to the specification, the specification has been amended. Accordingly, the objection is removed.

9. Applicant's arguments filed August 4, 2003 regarding claims 1-23 have been fully considered but they are not persuasive.

Applicant asserts on page 13:

> "Applicant submits that there is no teaching or suggestion that either the sensed ring signal or the sensed tip signal is provided to Defretin's low tension integrated circuit."

Examiner respectfully disagrees. As the rejection discussed above, Defretin teaches the sensed ring signal and the sensed tip signal (30, 32, 34, 36) are provided to low tension integrated circuit (CIBT) via signal *sd* (col. 3, line 66 – col. 4, line 11).

Applicant further asserts on page 13:

> "Applicant submits that *sd is* neither the sensed tip current nor the sensed ring current as alleged by the Examiner."

Examiner agrees that *sd is not* the sensed tip current nor the sensed ring current. The sensed tip current and the sensed ring current are 30, 32, 34, 36. These lines are input to current measurement circuit 38, the result signal *sd* is sent to low tension integrated circuit (CIBT; col. 3, line 66 – col. 4, line 11).

Applicant further asserts on page 15:

> "Although Defretin's ring and tip signals are sensed by an integrated circuit (CIHT), it is not the same integrated circuit that is generating the linefeed driver control (CIBT)".

Examiner respectfully disagrees. The above argument is not claimed in claim 4. Claim 4 states:

> "A subscriber loop linefeed driver comprising:

sense circuitry providing a sensed tip signal and a sensed ring signal to an integrated circuit wherein the sensed tip and ring signals correspond to a tip current and a ring current of the subscriber loop; and *power circuitry for providing battery feed to a ring node and a tip node of a subscriber loop in accordance with a control signal generated by the integrated circuit in response to the sensed tip and ring signals.*"

Thus, regarding claim 4, Examiner interprets there is no limitation that prevents the sensed tip and sensed ring signals from being sensed by another integrated circuit (e.g., signal *sd* to CIBT) after the sensed tip and sensed ring signals are sensed by integrated circuit (CIHT).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (703) 305-2341. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Customer Service Office at telephone number (703) 306-0377.

cpt CPJ
October 20, 2003

XU MEI
PRIMARY EXAMINER